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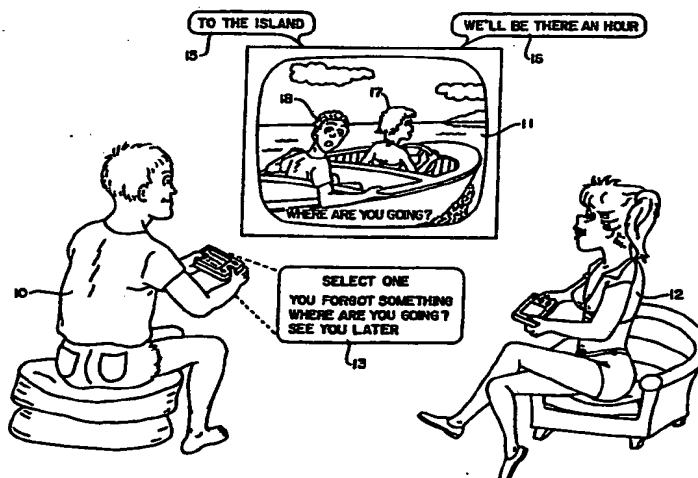
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(54) Title: TALKING VIDEO GAMES

(57) Abstract

This invention consists of video game methods of providing simulated voice conversations between one or more human players (10, 12) and two or more talking animated characters (17, 18) on a television or video screen (11). The animated characters (17, 18) talk to each other and to the human players (10, 12). Each player holds a light-weight controller that has push buttons (14) next to a display of variable phrases or sentences (13) for each player's side of the dialog. This dialog includes alternative words (13, 22, 26) for a human player to say to a character or for a character to say (15, 16, 20, 23, 27) or actions (Figs 3, 7) for a character to do. A player (10, 12) responds to what a character (17, 18) says or does by pressing a button (14) next to a selected phrase. An animated character then vocally responds (15 in Fig. 1) to the selected phrase as if it had been spoken by a human player or as if it were the character's own words. Another character (17) then responds to the first character (18). Thus the game can simulate three-way or four-way voice conversations.



+ DESIGNATIONS OF "SU"

Any designation of "SU" has effect in the Russian Federation. It is not yet known whether any such designation has effect in other States of the former Soviet Union.

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TALKING VIDEO GAMES

Technical Field

This invention relates to video games, animated cartoons, and picture/sound synchronization.

5 Background Art

We are all born with a desire to talk and to be talked to. Listening to other people talk and thereby sharing their emotional experiences is also a desire we are born with and this desire has been partly satisfied by motion picture film and television in which voice sounds are now essential. Until recently, voice sounds were seldom used in video games or were used in an optional manner. People have a desire to participate in voice conversations with other people, but this desire is not

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Adding voice sounds to conventional video games is not enough to simulate a face to face voice conversation. A talking video game called Thayer's Quest was attempted in 1984 and was played from an analog laser-readable video disc. One of the reasons for the commercial failure of Thayer's Quest was that each spoken sentence was programmed to accompany only one sequence of video frames. Since the video was not compressed, the maximum amount of play time was limited to about half an hour which was further reduced to a fraction of that by the branching story. Hence, only a few minutes of voice sounds were actually heard during the game. Whenever a human player saw a certain video character, the character usually spoke the same words. This greatly reduced the entertainment value of the game. Another consequence of programming the audio and video to be inseparable, was that branching scenes were not distinguished from branching dialog. Talking video games will be much more entertaining if each scene has a rich variety of possible dialog sequences.

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Talking video games are disclosed in my U.S. Patents Nos. 4,305,131; 4,333,152; 4,445,187 and 4,569,026. These patents show only one talking animated character and one human player, although multiple characters and players
5 were suggested in the texts. These patents also show push-button controllers that display alternative words to say to animated characters.

It is common practice in the video game art for stories to branch. It is also common practice for digital
10 data of animated characters to be stored separately from background scenery and to generate each frame of an animated picture from both the background data and the character data to minimize the number of stored images.

It is well known for human players to input choices
15 using any of a variety of input devices such as push buttons, rotatable knobs, pressure sensitive membrane, proximity sensitive pads or screen overlay, light pen, light sensitive gun, joy stick, mouse, track ball, moving a cursor or crosshairs or scrolling through highlighted
20 options, speech recognition, etc.

In the prior art, each choice by the human can be immediately followed by a synthesized voice or digitized voice recording that speaks the words selected by the human player, so the human will quickly adjust to the fact
25 that the spoken words he hears for his side of the dialog are initiated by his fingers rather than his vocal cords.

The prior art also includes methods for generative video images of moving lips and facial expressions on a talking head or other animated character. See for
30 example, U.S. Patent No. 4,884,972 issued December 5, 1989 to Elon Gasper who contemplates use in video games.

Drawing Figures

FIG. 1 illustrates an animated cartoon talking game with two human players who take turns selecting words to
35 say to one or two animated characters on a TV screen who then respond to the words.

FIG. 2 illustrates an animated talking game with one human player and two animated cartoon characters on a TV screen who talk to the human and to each other.

5 FIG. 3 is an animated cartoon illustrating a kissing scene in which one character's unspoken thoughts are sounded.

FIG. 4 is an animated cartoon illustrating a ledge-hanging scene in which a talking cartoon character requires immediate action by the human player.

10 FIG. 5 is an animated sequence illustrating branching dialog in which two cartoon characters respond to sentences selected by a human player by talking to the human player and to each other.

15 FIG. 6 is an animated sequence illustrating branching dialog in which one animated character responds to a sentence selected by a human player and refers to a second character (not shown).

20 FIG. 7 is an animated sequence showing hands simulating the hands of a human player performing an action.

FIG. 8 is a flow diagram illustrating scene branching and dialog branching within each scene.

25 FIG. 9 is a pictorial view of a video game system having a CD-ROM disc drive connected to a television or video monitor with auxiliary devices for displaying prompting words.

Description of Preferred Embodiments

30 Characters in role-playing video games are of two kinds: player-controlled characters and non-player characters. A player-controlled character is a human player's animated counterpart and does what the human player chooses to have him do. Non-player characters are not directly controlled by a human player, but can be indirectly influenced by a human player, either by
35 responding to an action selected by the human player or by responding to what a player-controlled character does or says. Non-player characters should be programmed to say

many different alternative things depending on what a player or player-controlled character has just "said". A scene may repeat several times with a non-player character saying something different each time and the alternative
5 responses for each human player being different each time a scene is repeated.

Hand-held controllers are preferable to displaying menus on the video screen, because in two-person games the menu displayed to one player may be different from the
10 other player's menu. Part of the fun comes from a player not knowing what choices the other player has. Also, video screen menus disrupt the illusion that a player is talking with a real video character. Hence, the preferred
15 embodiment of my invention makes use of hand-held menu display controllers with a push-button or equivalent for each menu item. The invention also makes use of echo voices that repeat the selected words so that other human players will know what is being said.

Referring to FIG. 1, in a typical embodiment of this
20 invention a video game system displays on a video screen 11 an animated picture sequence to two human game players. Human players 10 and 12 take turns selecting a phrase or sentence to "say" to a character or characters on a video screen who then talk back responsively. In this example
25 it is player 10's turn. Player 12's hand-held controller is blank, indicating that she cannot say anything to a character at this moment. The video screen shows two animated characters traveling in a boat or other vehicle. The characters are non-player characters that talk
30 directly to human players in this example. Each human player holds a hand-held controller with three push buttons next to a liquid-crystal display 13, shown enlarged in FIG. 1 for clarity.

As the boat scene begins, the video game system
35 displays two or three or more alternative responses on display 13 or other display device. While player 10 is deciding which button to press, a linking picture sequence

(not shown) continues to show the same boat scene with one character looking back from the boat as if looking at player 10 standing on the dock. Player 10 selects one of the displayed responses (in this example "WHERE ARE YOU GOING?") which is then echoed as voice sounds or is displayed as sub-titles on the video screen so that player 12 will know what player 10 has just said to an animated character. This character 18 answers responsively with voice sounds: "TO THE ISLAND." after which a second character 17 responds with "WE'LL BE THERE AN HOUR." in response to what character 18 just said.

In the preferred embodiment, the game system generates a voice to echo the words selected by player 10 so that player 12 hears what player 10 has "said" to the animated character. When it is player 12's turn, player 12's hand-held controller will then display alternative words (not shown in FIG. 1) that she can "say" in response to what animated character 17 or 18 has said. Thus a three-way or four-way dialog can be simulated.

Before each game begins, display 13 may show identifying information for each player-controlled character so that each human player may select which character he or she wants to play. Alternatively, each player-controlled character may be shown on video screen 11 and the question asked "Who wants to play this character?" for each character shown. The game system then records which hand-held controller responds to the question, so later that character's words will be shown on display 13 only for the player who is playing that character (in this example player 10). A human player may also choose to play a player-controlled character that need not always be shown on the video screen, but who may be off-screen (for example, standing on the dock in FIG. 1), and can carry on a dialog with on-screen characters.

Referring to FIG. 2, in another embodiment of the invention, a video game system displays on a video screen 11 an animated picture sequence having two or more

animated talking characters 17 and 18. In this example, character 17 is a player-controlled character that human player 12 controls. Player 12 plays the role of character 17 and can talk to character 18 and other characters in the game through character 17. Player 12 holds a hand-held controller with three push buttons next to a liquid-crystal display 13, shown enlarged in FIG. 2 for clarity. The game system displays three alternative responses on display 13. Player 12 selects one of the displayed responses (in this example "KISS ME AGAIN") with push button 14. The echo voice sounds 15 for character 17 then repeat the words selected from display 13. The words are directed at character 18 whose voice sounds 16 then respond to character 17.

The two animated characters may respond in reverse sequence, that is, the non-player character 18 may say his line first so that the player-controlled character 17 can respond as ordered by human player 12. For example, after player 12 selects "KISS ME AGAIN", character 18 may say "WHAT DO YOU WANT TO DO?" a prerequisite sentence that is not one of the displayed alternatives, then character 17 can respond with "KISS ME AGAIN" which is responsive to what character 18 has just said.

Echo voices or sub-titles may also be used to express unspoken thoughts or the thoughts of non-speaking beings such as babies or animals or inanimate objects. Cloud balloon 19 in FIG. 2 represents an unspoken thought of character 18 which is sounded (with mouth not moving) in response to spoken sentence 15 of character 17. Voice sounds for unspoken thoughts may be electronically altered to indicate to players that a voice is not a normal spoken voice. For example, unspoken thoughts can be given a hollow or tremulous sound or a whispering sound by electronically or digitally editing voice sound data before converting to audio.

Referring to FIG. 3, when characters 17 and 18 perform a competitive or cooperative activity such as

kissing, one of the characters may speak (with moving mouth) or think unspoken thoughts (sounded with unmoving mouth) as in cloud balloon 29, responsive to the action being shown or to what was said or done in the prior sequence shown in FIG. 2 or in response to a phrase selected from display 13.

Referring to FIG. 4, in another embodiment of this invention, a video game system generates an animated picture sequence showing a character hanging by his fingers from a ledge on the outside of a building. His friends on the roof have thrown him a rope which is not long enough to reach the FIG. 4 character. This ledge-hanging situation is followed by the next scene shown in FIG. 5.

Referring to FIG. 5, picture sequences 21, 25, and 28 are parts of one roof scene in which two talking characters discuss how to rescue the character in FIG. 4. One or two human players participate in the conversation by "saying" words or phrases or sentences to the animated characters who then answer responsively and ask questions or make remarks that lead to the next input by a player. The alternatives shown on display 22 are suggested solutions to the problem posed in sentence 20. When the human player 10 presses button 14 next to "CALL EMERGENCY", one of the characters responds by asking question 23 to the other character who responds with question 24 directed at the human player. Question 24 is also accompanied by alternative actions 26. When a player presses the button next to "SLIDE DOWN THE ROPE", a character comments on this choice of action with sentence 27 in sequence 28. Thus a simulated verbal dialog can continue through several exchanges of words within the same scene.

Referring to FIG. 6, in another embodiment of this invention a video game system generates animated picture sequence 31 and 32. The picture sequence has one scene showing a burning car in the background and a frightened

woman 17 in the foreground. During part 31 of the sequence the woman's voice 15 says "PLEASE HELP ME! MY MOTHER IS TRAPPED IN THE CAR!" The game then displays two or more alternative responses. Human player 10 selects one of the displayed responses (such as "PRY THE DOOR OPEN") and presses the corresponding push button 14 or equivalent. While the player is deciding which button to press, a linking picture sequence (not shown) continues to show the same scene with the woman looking anxiously at the player. When the player selects a response, part 32 of the animated sequence continues showing the same burning car scene with the woman's voice 16 answering responsively: "I TRIED TO, BUT I CAN'T GET IT OPEN"

Selecting a response by pushing a button 14 can result in a change to a different scene, but in this FIG. 6 example the scene remains the same and only the dialog changes. Each of the three alternative responses on display 13 will result in a different answer by animated character 17. The animated sequences 31 and 32 are generated by the video game system by overlaying three moving pictures: (1) the background sequence showing the burning car with flames continually flickering, (2) a sprite or mosaic of sprites showing the woman character 17 moving in a natural manner against the background and (3) mouth and other facial sprites selected (by table lookup) by the game system approximately lip-synchronized with voice sounds 15 and 16.

Since the player's response time is variable, sequence 31 or 32 with a closed mouth sprite should cycle continually until a button 14 is pressed or until a time limit is reached, at which time a prompting picture sequence with words such as "Hurry! Hurry!" may be sounded and displayed with moving mouth sprites. The burning car can be any object such as a damaged bus, airplane, boat, or building that provides a danger situation.

Referring to FIG. 7, the game system displays on the video screen an animated sequence showing one or more

hands 36 simulating the hands of a human player performing an action. In this example, animated sequence 33 shows a hand holding pipe 35 or a fire extinguisher or other such tool while the human player whose real hand 10 is

5 illustrated pressing button 14 next to display 13 selects one of the alternative actions shown on display 13. Note that display 13 in FIG. 7 shows alternative actions which would result in scene changes, but display 13 in FIG. 6 shows alternative words or phrases to say to animated

10 character 17 in a common scene. In FIG. 7, pressing button 14 to select "PRY THE DOOR OPEN" results in picture sequence 34 showing hands 36 prying open the car door with pipe 35.

The flowchart shown in FIG. 8 illustrates the

15 distinction between branching dialog and branching scenes. For example, in scene 64 branch point 60 is displayed to the player showing two alternative verbal responses 61 or 62. Either verbal response results in a different answer from an animated character, but not a scene change.

20 However, the alternatives at branch point 63 will result in a scene change, either to scene 65 or to scene 66. Branch point 62 may result in either a scene change to scene 67 or a dialog branch depending on a player's choice.

25 To allow each background scene to be used with different animated characters who can move around against the background scene, the digital animation data for the background scene should be stored separately from the digital animation data for each character. Similarly, to

30 allow each character to say many different sentences without a scene change, the digitized voice data should be independent of the animation data. In the preferred embodiment, animated character video, voice sound sequences and guidance word sequences are generated

35 independently from separately stored digital data. Dialog data that is not used in one scene may be used later in a different scene with the same or different characters.

The voice data may consist of sequences of codes or compressed digital recordings of words, phrases, word segments or phonemes in several distinctive voices so that each character can speak thousands of preprogrammed words or sentences. Similarly, the digital data for each animated character's body may be stored separately from sprite data for moving lips, facial expressions, and gestures, so that each character and its distinctive voice can be lip-synchronized with different mouth movements depending on the dialog. The digital data for each animated character may also combine body images, lips, facial expressions, hand gestures and voice sounds.

Referring to FIG. 9, video game system 42 is connected by cables to a television 11 or video monitor and to one or more hand-held control units 44 and 47 or portable game system 46, each having three push buttons 14 next to a liquid-crystal display 13. Infra-red or radio signals may be used instead of cables. System 42 includes a disk reader that reads digital data from a CD-ROM disk 43, or write-once disk or card or other medium containing digital data from which system 42 generates animated picture sequences, compressed audio for voice and other sounds, synchronizing data, and words to display on units 44, 46 and 47. Portable game system 46 with appropriate ROM program cartridge may substitute for units 44 and 47. Cable 45 connects game system 42 to controllers 44, 46 or 47 and transmits alternative guidance words or other verbal expressions for display on displays 13. Cable 45 also transmits push-button 14 responses to game system 42.

If portable game system 46 has only one or two available push-buttons, selection from among responses shown on display 13 may be done as shown in FIG. 7 by pressing push-button 14 multiple times to position a pointer 49, cursor, or other such indicator next to (or on) a selected sentence.

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When a human player presses a button 14 (FIG. 2, 5, 6, or 7), the game system may generate a voice sound speaking the selected sentence as a substitute for the player's side of the dialog. The animated character then
5 "responds" as if the generated voice sounds had been spoken by the human player. Because the player selects the words which are actually sounded, he will quickly adjust to the fact that the spoken words he hears for his
10 side of the dialog are initiated by his fingers rather than his vocal cords. This echo voice is important for games with multiple human players so that each player will hear what each of the other players has "said" to on-screen characters. Pushing a button 14 selects both a simulated verbal response to the previous words spoken by
15 an animated character and also selects a new dialog sequence that corresponds to the simulated verbal response shown on display 13. The selected dialog sequence includes the face and voice of the animated character speaking words which are responsive to the player's
20 selected verbal response.

Alternatively, sub-titles such as illustrated on video screen 11 in FIG. 1 may be used instead of echo voices and be displayed on a video screen or on a
hand-held controller as a substitute for the player's side
25 of the dialog. Digitized live action picture sequences are equivalent to animated cartoon picture sequences for this invention. The term "verbal expression" means any word, words, phrase, sentence, question, expletive, curse, keyword, combination of keywords, symbol, or any
30 meaningful human voice sound such as "huh?" or "hmmm" or laughter or scream. The word kissing is used herein to mean simulated touching of one animated character's mouth to another animated character's mouth or other body part.

No video game yet satisfies the basic human desire
35 for people to speak and respond to us as individuals. Although the telephone provides a partial satisfaction of our desire to talk with other people, it is necessarily

limited to living people who are willing to talk with us. Historical and imaginary people cannot talk with us and famous living people do not want to. Hence, there is a strong but unfulfilled human desire waiting to be

5 satisfied by new technology. Talking animated characters will change the nature of video games as dramatically as talking pictures changed silent film. Talking video games will let human players talk with images of famous people (living or historical or imaginary) and with animal-like

10 characters, and participate in simulated adventures and dramas and conversations with interesting characters and groups of characters who will talk to each player responsively. Talking video games that stir human emotions like dramatic films will have lasting appeal,

15 because they will satisfy a basic human desire, the desire to talk with other people.

Although I have described the preferred embodiments of my invention with a degree of particularity, it is understood that the present disclosure has been made only

20 by way of example and that equivalent steps and components may be substituted and design details changed without departing from the spirit and scope of my invention.

CLAIMS

1. A video game method of simulating voice conversations between at least two talking animated characters and one or more human players of the video game, comprising the steps of:
 - 5 generating animated pictures showing first and second talking characters having voices that are noticeably different;
 - generating first voice sounds in the voice of one of
10 said talking characters;
 - displaying on a control device held by a first human player a first plurality of alternative verbal expressions responding to said first voice sounds;
 - receiving from said control device an indication of
15 which verbal expression is selected by said human player from said plurality thereof;
 - generating second voice sounds responding to said selected verbal expression in the voice of said first talking character;
 - 20 generating third voice sounds in the voice of said second talking character responding to said second voice sounds; and
 - displaying on a control device held by a second human player a second plurality of alternative verbal
25 expressions responding to said third voice sounds.
2. The method of claim 1 wherein said first and second human players are the same person holding the same control device.
3. The method of claim 1 wherein said talking
30 animated characters are animated cartoons.
4. The method of claim 1 wherein the animated pictures of said talking animated characters are generated from digitized images of living people.

5. The method of claim 1 wherein at least some of said voice sounds are altered to indicate that the altered voice sounds represent unspoken thoughts of one of said characters.
- 5 6. The method of claim 1 wherein the step of generating said first voice sounds is delayed and performed between said receiving step and the generating of said second voice sounds.
- 10 7. The method of claim 1 wherein said selected verbal expression describes a selected action and said second voice sounds talk about the feasibility of the selected action.
- 15 8. The method of claim 1 wherein said generated animated pictures show one of said talking characters in a dangerous situation and said first plurality of alternative verbal expressions describe alternative actions to rescue the endangered character from the dangerous situation.
- 20 9. The method of claim 1 wherein said second voice sounds say the words of said selected verbal expression.
10. The method of claim 9 wherein said second voice sounds say words in a voice noticeably different than the voices of said first and second talking characters.
- 25 11. The method of claim 1 wherein said generated animated pictures show one of said characters hugging or kissing the other character in accordance with any of said voice sounds.
12. The method of claim 1 wherein said animated

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5 pictures show one of said talking characters with a closed unmoving mouth during at least some of the character's voice sounds to indicate that the voice sounds represent unspoken thoughts of the talking character.

13. A video game method of simulating voice conversations between a talking animated character and at least two human players of the video game, comprising the steps of:
- 10 generating animated pictures showing a talking animated character;
displaying a first plurality of alternative verbal expressions on a first control device held by a first human player;
 - 15 receiving from said first control device an indication of which first verbal expression is selected by said first human player from said first plurality of verbal expressions;
electronically communicating said first selected
 - 20 verbal expression to a second human player;
generating voice sounds responding to said first selected verbal expression in the voice of said talking animated character;
displaying on a second control device held by said
 - 25 second human player a second plurality of alternative verbal expressions responding to said voice sounds.
receiving from said second control device an indication of which second verbal expression is selected by said second human player from said second
 - 30 plurality of verbal expressions; and
electronically communicating said second selected verbal expression to said first human player.

14. The method of claim 13 wherein said first control device indicates which of the human players
- 35 should respond to the plurality of verbal expressions.

15. The method of claim 13 wherein said first selected verbal expression is communicated to said second human player by displaying the first selected verbal expression.
- 5 16. The method of claim 13 wherein said first selected verbal expression is communicated to said second human player by generating voice sounds expressing the first selected verbal expression.
- 10 17. The method of claim 13 wherein said talking animated character is an animated cartoon.
18. The method of claim 13 wherein the animated pictures of said talking animated character are generated from digitized images of living people.
- 15 19. The method of claim 13 wherein said voice sounds say the words of said selected verbal expression.
- 20 20. The method of claim 13 wherein at least some of said voice sounds are noticably different than the voice of said talking character to represent unspoken thoughts of the talking character.
- 25 21. The method of claim 13 wherein said animated pictures show said talking character with a closed unmoving mouth during at least some of said voice sounds to indicate that said voice sounds represent unspoken thoughts of said talking character.
22. A video game method of simulating interaction between at least two talking animated characters and one or more human players of the video game, comprising the steps of:

generating animated pictures showing first and second talking characters having voices that are noticeably different and encountering a situation requiring a choice of one action from a plurality of alternative actions;

5 displaying on a control device held by a first human player words describing each action in said plurality of alternative actions;

10 receiving from said control device an indication of which selected action in said plurality thereof is chosen by said first human player;

generating first voice sounds in the voice of said first talking character repeating the displayed words describing said selected action;

15 generating second voice sounds in the voice of said second talking character responding to said first voice sounds; and

20 displaying on a control device held by a second human player words describing a second plurality of alternative actions responding to said second voice sounds.

23. The method of claim 22 wherein one of said characters is shown in a dangerous situation and said voice sounds describe methods of helping the endangered character.

24. The method of claim 23 wherein some of said voice sounds ask for guidance in helping said endangered character.

25. The method of claim 22 wherein said animated pictures show one of said talking characters or a portion thereof performing said selected action in accordance with said voice sounds.

26. The method of claim 22 wherein some of said

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voice sounds comment on said selected action;

27. The method of claim 22 wherein some of said voice sounds refer to a character affected by said selected action;

5 28. The method of claim 22 wherein said generated animated pictures show one of said characters hugging or kissing the other character in accordance with said first or second voice sounds.

10 29. A video game method of simulating voice conversations between at least two talking animated characters and one or more human players of the video game, comprising the steps of:

generating animated pictures showing first and second talking characters having voices that are
15 noticeably different;

generating first voice sounds in the voice of one of said talking characters;

displaying to a first human player a first plurality of alternative verbal expressions responding to said
20 first voice sounds;

receiving from said first human player an indication of which verbal expression is selected by the player from said plurality thereof;

generating second voice sounds responding to said
25 selected verbal expression in the voice of said first talking character;

generating third voice sounds in the voice of said second talking character responding to said second voice sounds; and

30 displaying to a second human player a second plurality of alternative verbal expressions responding to said third voice sounds.

30. The method of claim 29 wherein said first and

second human players are the same person.

31. The method of claim 29 wherein said second voice sounds say the words of said selected verbal expression.

- 5 32. The method of claim 29 wherein said selected verbal expression describes a selected action and one of said characters performs the selected action.

- 10 33. The method of claim 32 wherein said generated animated pictures show one of said characters hugging or kissing the other character in accordance said selected action.

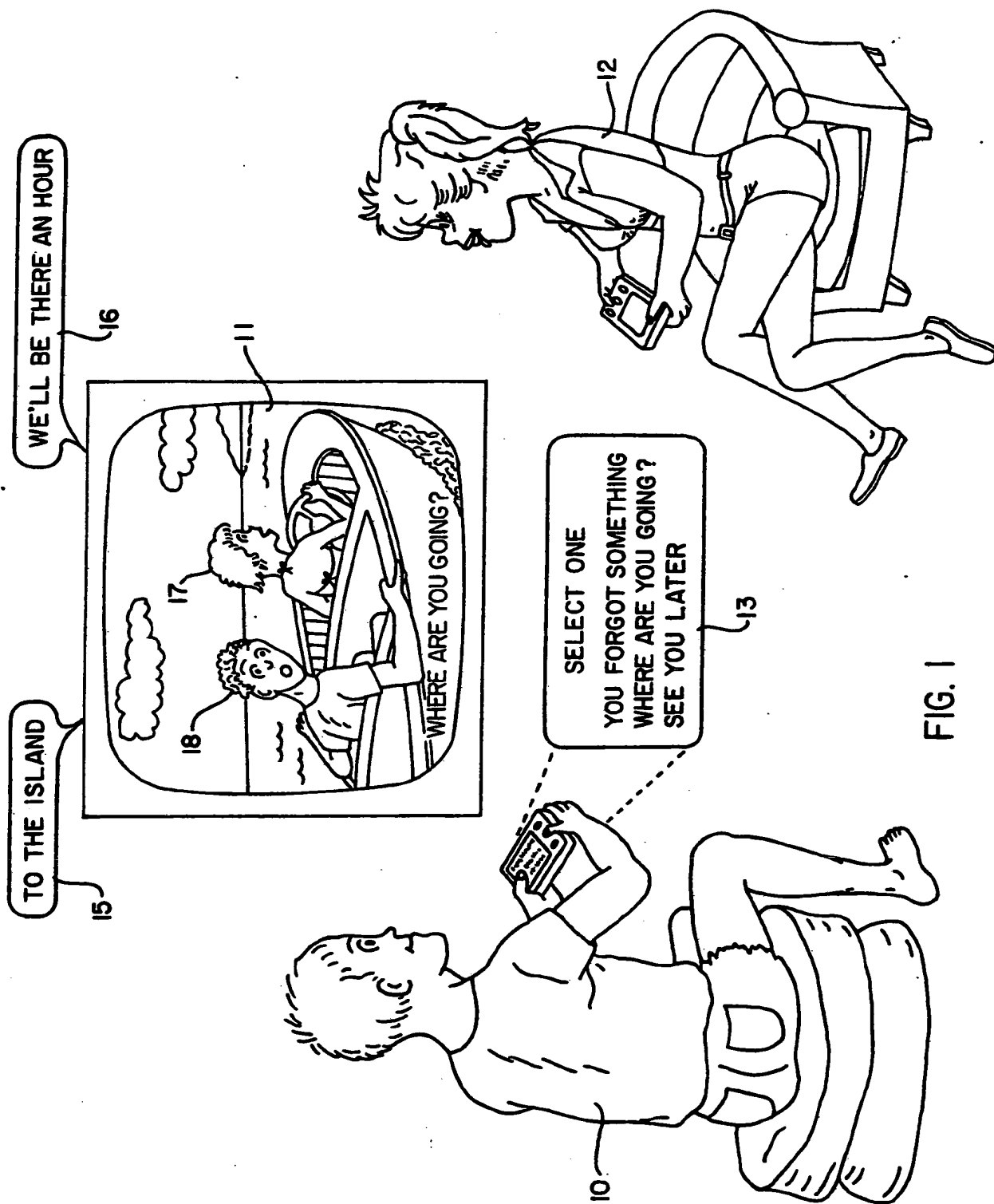
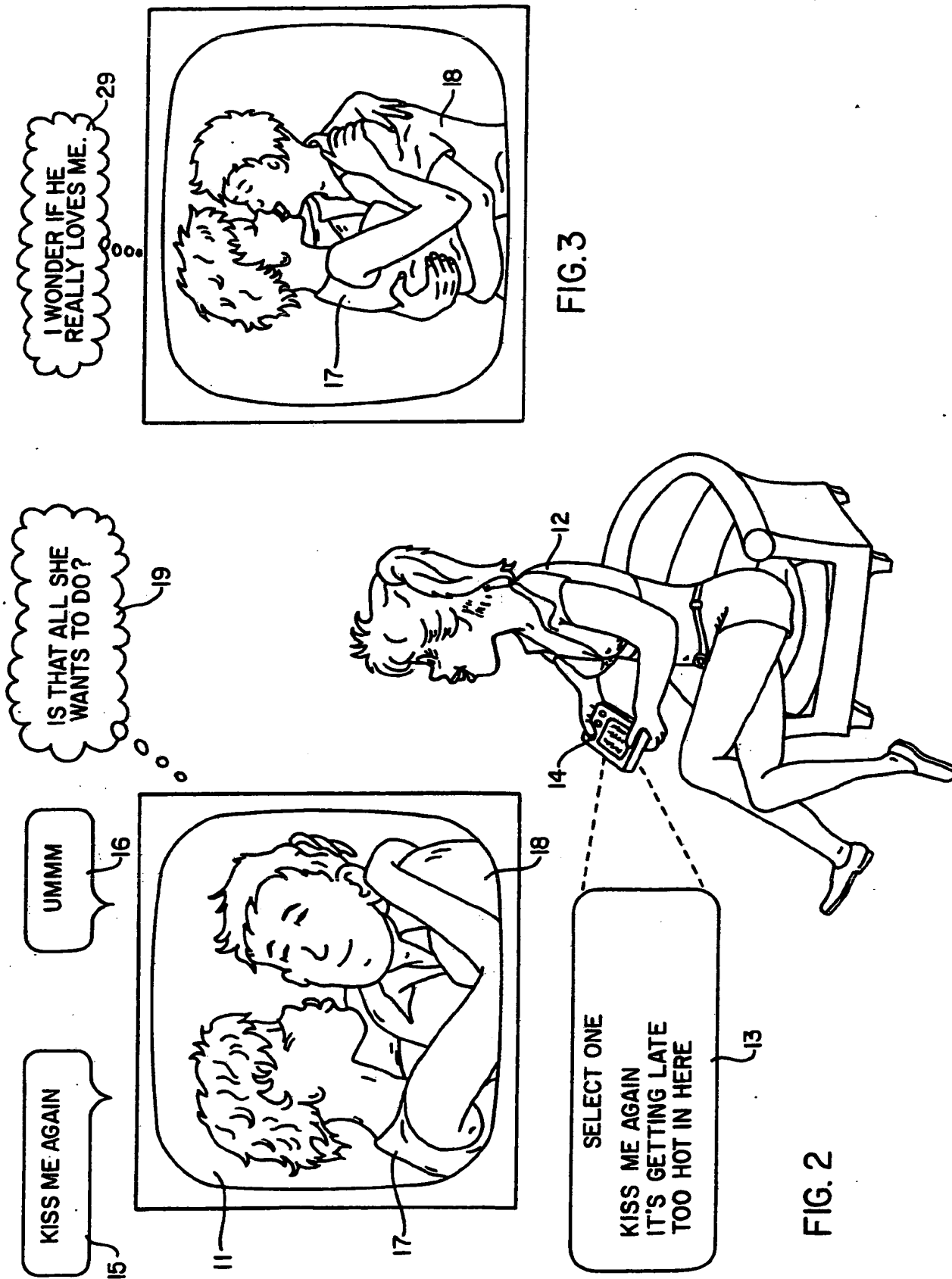


FIG. 1



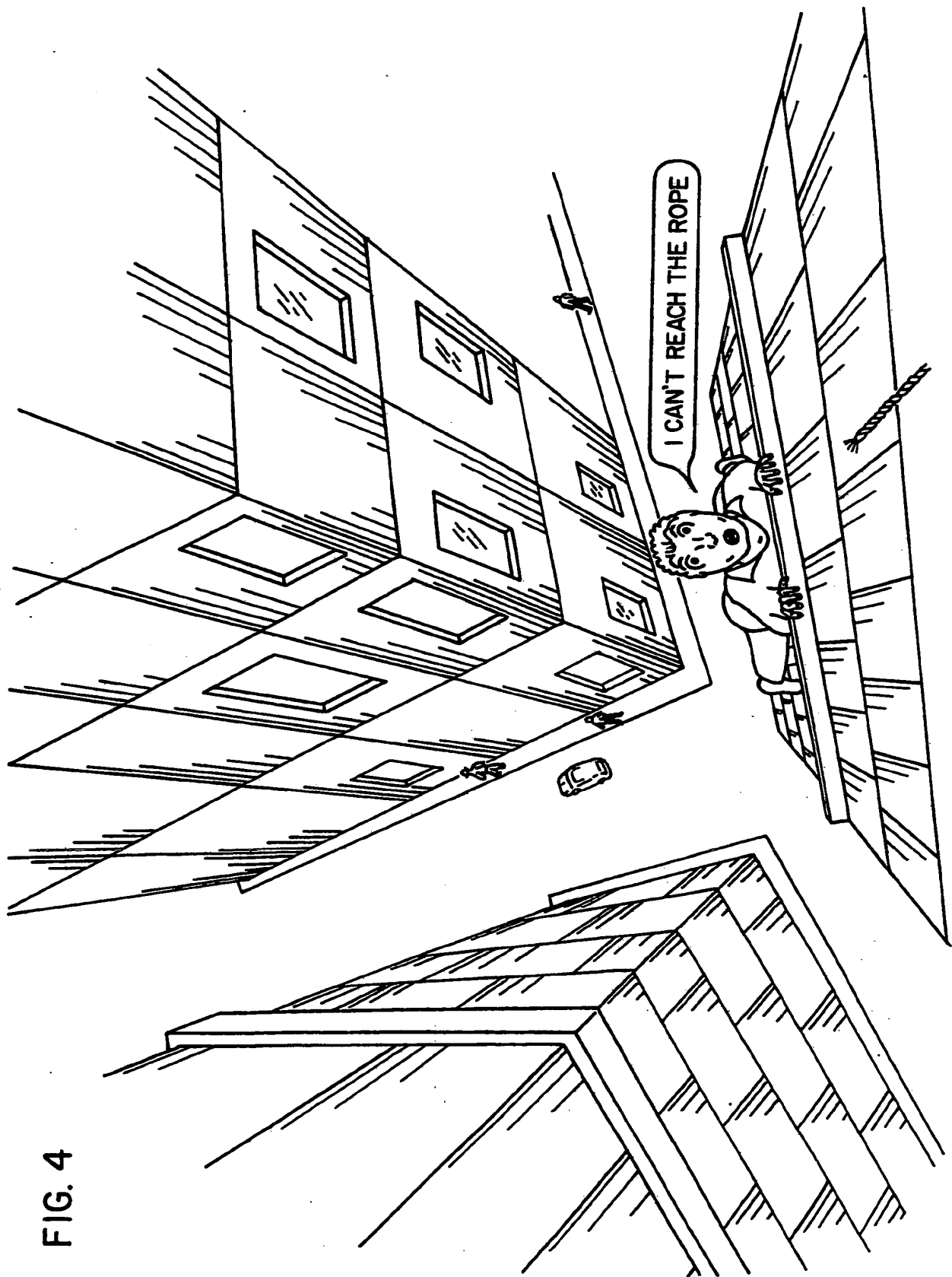


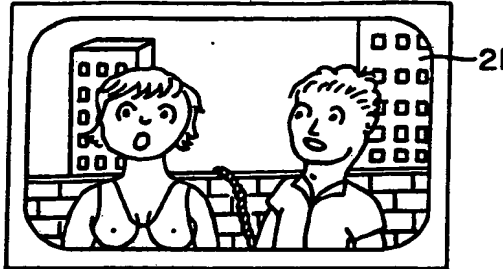
FIG. 4

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THE ROPE ISN'T
LONG ENOUGH.

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FIG. 5



GET A LONGER ROPE
WHAT SHOULD WE DO?
CALL EMERGENCY

22

14

10

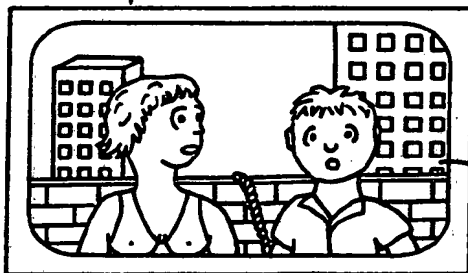
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DID YOU CALL THEM?

24

YES, BUT WE CAN'T WAIT
WHAT DO WE DO NOW?

25



SLIDE DOWN THE
ROPE? ARE YOU
CRAZY?

27

SLIDE DOWN THE ROPE
GET A LONGER ROPE
SPLIT THE ROPE IN TWO

26

12

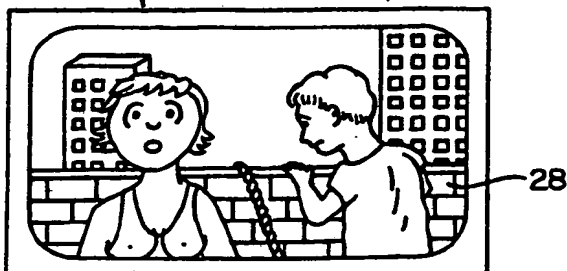


FIG. 6

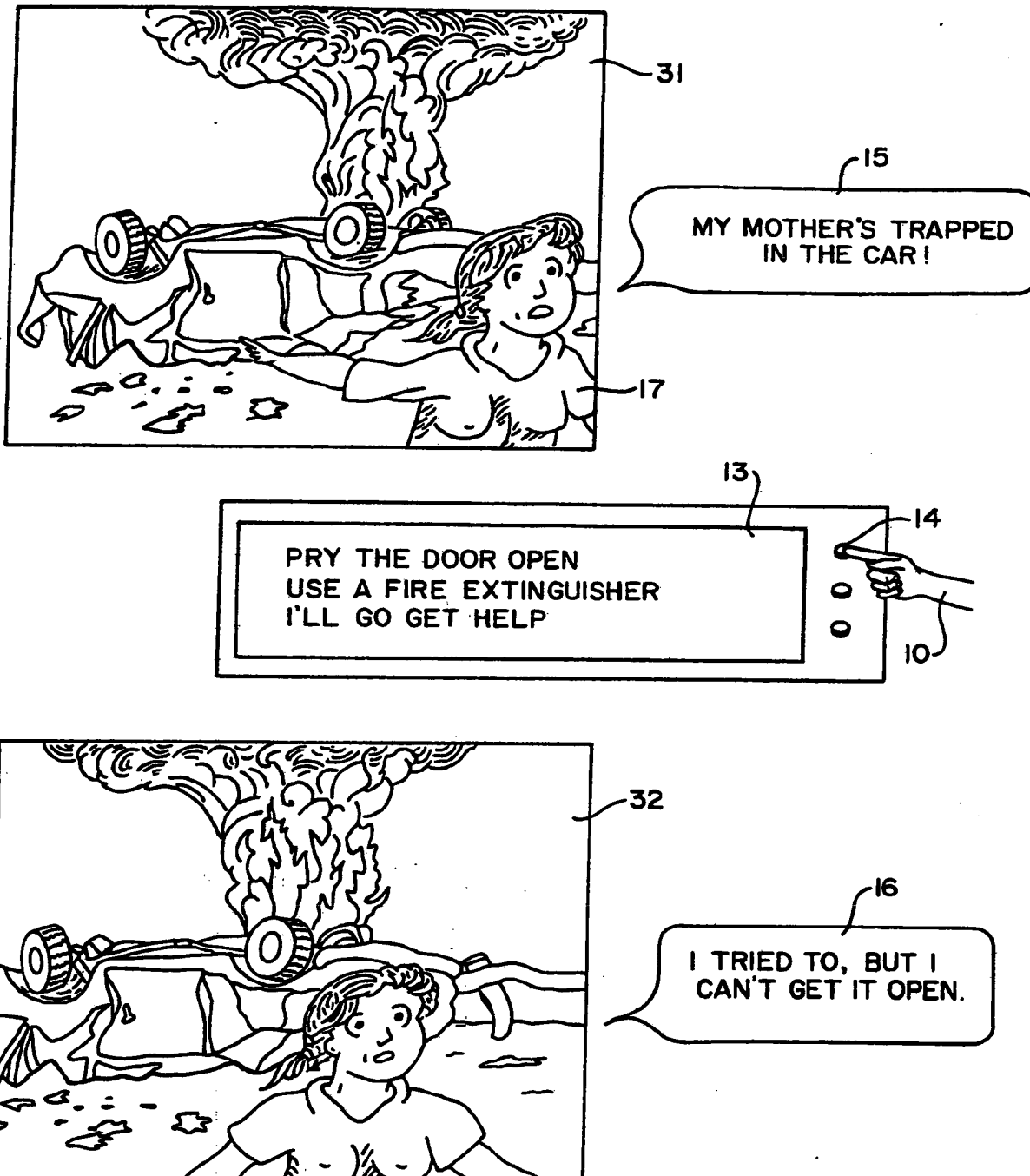


FIG. 7

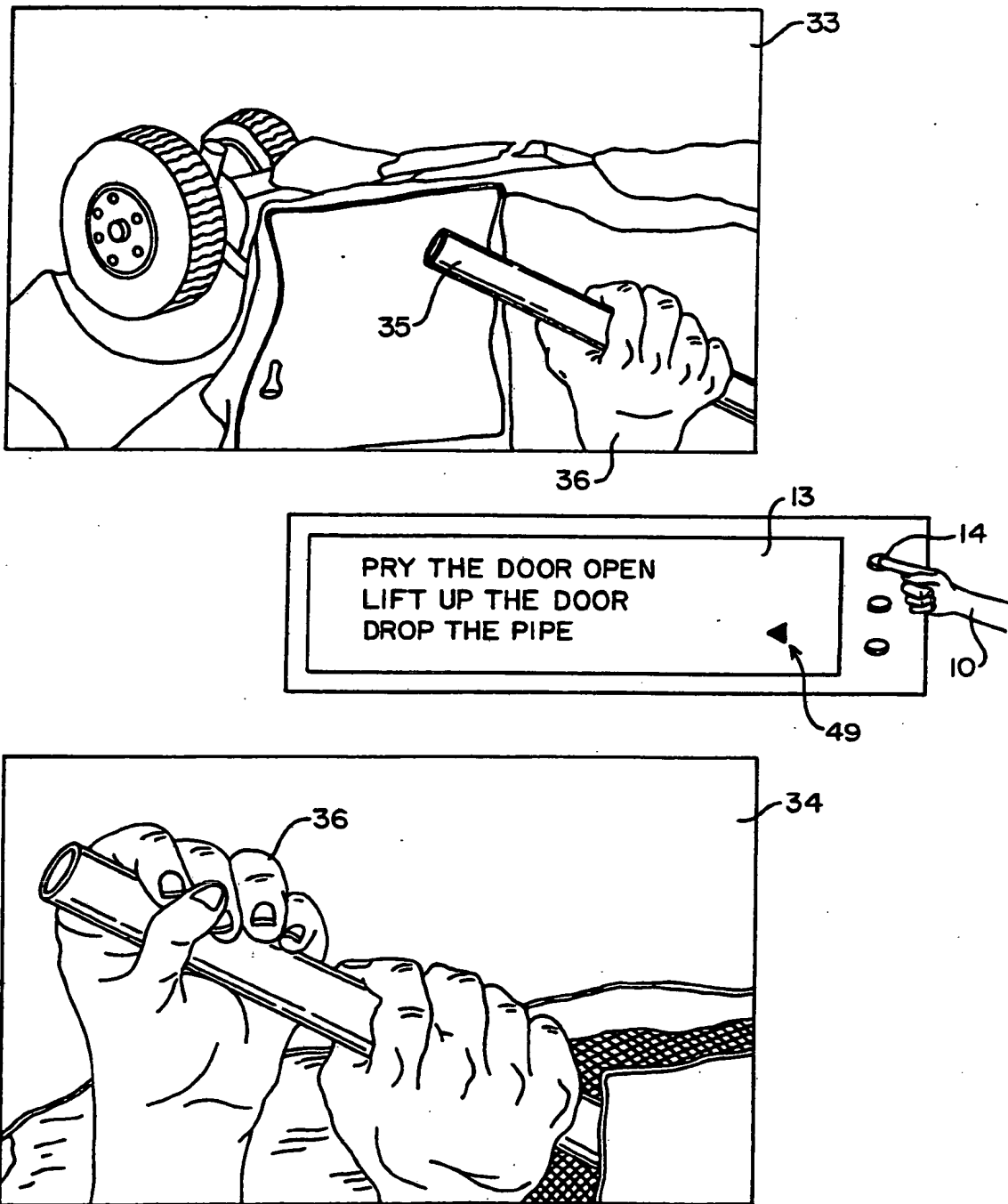
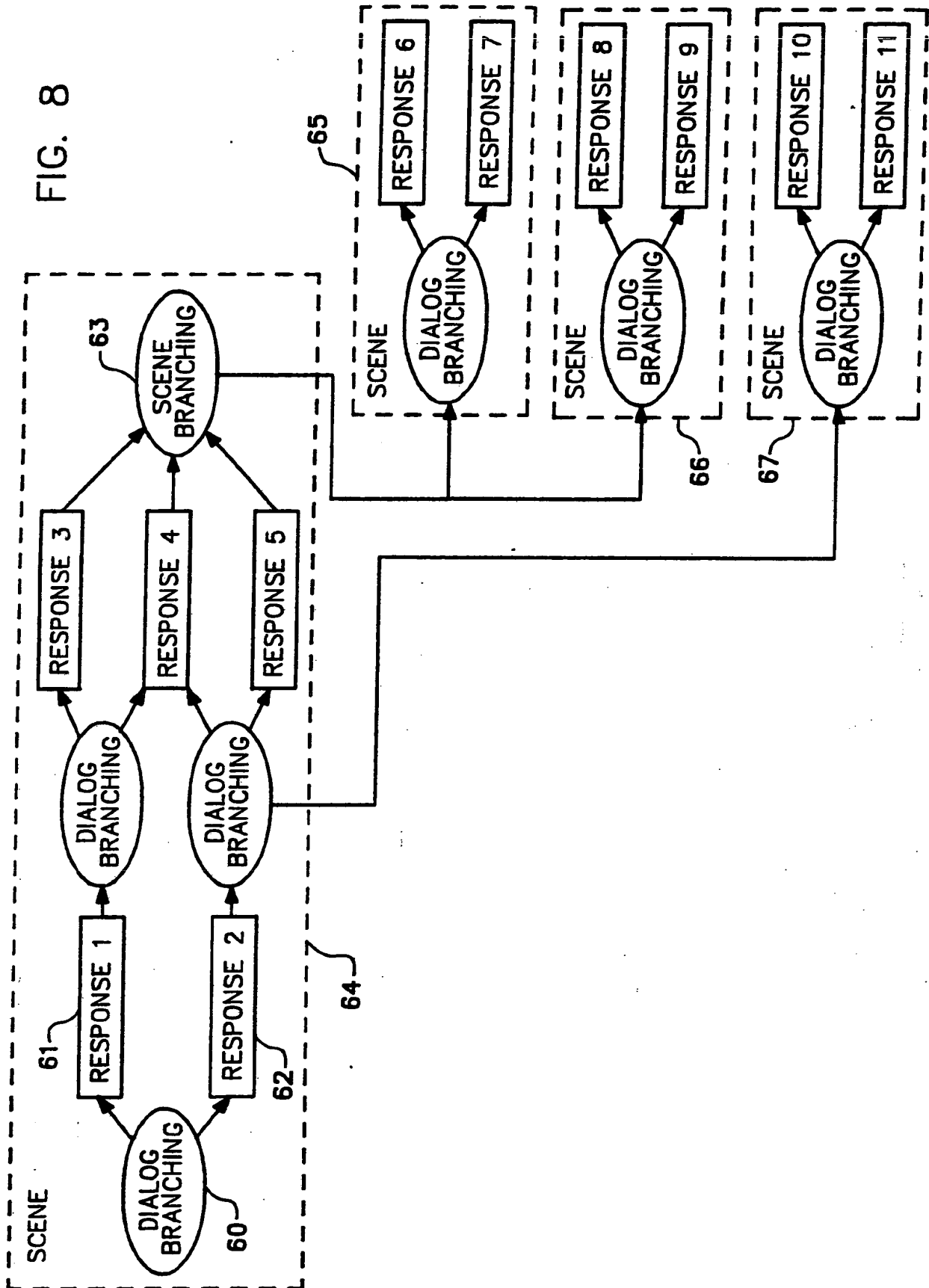


FIG. 8



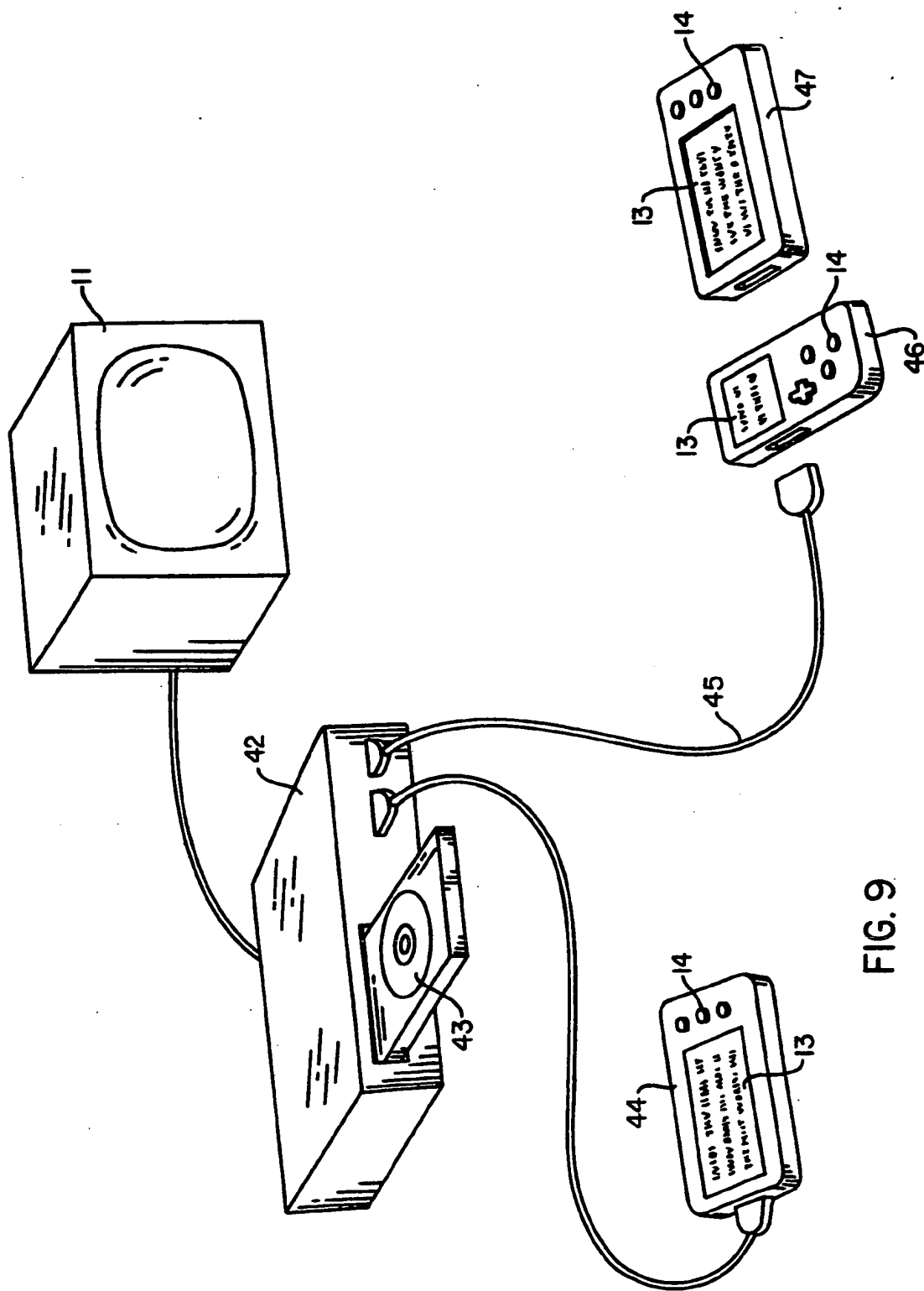


FIG. 9

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 91/07266

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶ According to International Patent Classification (IPC) or to both National Classification and IPC Int.C1. 5 A63F9/22; G09B7/04											
II. FIELDS SEARCHED <div style="text-align: center; border: 1px solid black; padding: 2px; margin: 5px 0;">Minimum Documentation Searched⁷</div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; border: 1px solid black; padding: 5px;">Classification System</td> <td style="border: 1px solid black; padding: 5px;">Classification Symbols</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">Int.C1. 5</td> <td style="border: 1px solid black; padding: 5px;">A63F ; G09B</td> </tr> </table> <div style="text-align: center; border: 1px solid black; padding: 2px; margin: 5px 0;">Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched⁸</div>			Classification System	Classification Symbols	Int.C1. 5	A63F ; G09B					
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Int.C1. 5	A63F ; G09B										
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹ <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%; padding: 5px;">Category⁹</th> <th style="width: 70%; padding: 5px;">Citation of Document,¹¹ with indication, where appropriate, of the relevant passages¹²</th> <th style="width: 20%; padding: 5px;">Relevant to Claim No.¹³</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">A</td> <td style="padding: 5px;"> EP,A,0 016 314 (BEST, ROBERT MACANDREW) 1 October 1980 cited in the application see page 2, line 1 - page 3, line 24 see page 8, line 5 - page 9, line 32 see page 29, line 32 - page 30, line 2 see figures 10,13 --- </td> <td style="vertical-align: top; padding: 5px;"> 1-3, 9, 10, 13, 16, 17, 19, 22, 29, 30, 31 </td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">A</td> <td style="padding: 5px;"> US,A,4 846 693 (BAER) 11 July 1989 see column 4, line 35 - line 49 see column 8, line 7 - line 43; figure 1 --- <div style="text-align: center;">-/-</div> </td> <td style="vertical-align: top; padding: 5px;"> 1, 3, 4, 13, 17, 18, 22, 29 </td> </tr> </tbody> </table>			Category ⁹	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³	A	EP,A,0 016 314 (BEST, ROBERT MACANDREW) 1 October 1980 cited in the application see page 2, line 1 - page 3, line 24 see page 8, line 5 - page 9, line 32 see page 29, line 32 - page 30, line 2 see figures 10,13 ---	1-3, 9, 10, 13, 16, 17, 19, 22, 29, 30, 31	A	US,A,4 846 693 (BAER) 11 July 1989 see column 4, line 35 - line 49 see column 8, line 7 - line 43; figure 1 --- <div style="text-align: center;">-/-</div>	1, 3, 4, 13, 17, 18, 22, 29
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<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>¹⁰ Special categories of cited documents :</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"A" document member of the same patent family</p> </div> </div>											
IV. CERTIFICATION <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border: 1px solid black; padding: 5px;"> Date of the Actual Completion of the International Search <div style="text-align: center; font-weight: bold;">18 MARCH 1992</div> </td> <td style="width: 50%; border: 1px solid black; padding: 5px;"> Date of Mailing of this International Search Report <div style="text-align: center; font-weight: bold;">31. 03. 92</div> </td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;"> International Searching Authority <div style="text-align: center; font-weight: bold;">EUROPEAN PATENT OFFICE</div> </td> <td style="border: 1px solid black; padding: 5px;"> Signature of Authorized Officer <div style="text-align: center; font-weight: bold;">DE DIEULEVEULT A.J. </div> </td> </tr> </table>			Date of the Actual Completion of the International Search <div style="text-align: center; font-weight: bold;">18 MARCH 1992</div>	Date of Mailing of this International Search Report <div style="text-align: center; font-weight: bold;">31. 03. 92</div>	International Searching Authority <div style="text-align: center; font-weight: bold;">EUROPEAN PATENT OFFICE</div>	Signature of Authorized Officer <div style="text-align: center; font-weight: bold;">DE DIEULEVEULT A.J. </div>					
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III. DOCUMENTS CONSIDERED TO BE RELEVANT

(CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
A	<p>EP,A,0 299 831 (ACTV, INC.) 18 January 1989</p> <p>see page 2, line 56 - page 3, line 30</p> <p>see page 6, line 10 - page 9, line 1</p> <p>---</p>	<p>1,13,22, 29</p>

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

US 9107266
SA 54193

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A-0016314	01-10-80	JP-B- 1042702	14-09-89
		JP-C- 1556591	23-04-90
		JP-A- 55112000	29-08-80
		US-A- 4305131	08-12-81
		US-A- 4333152	01-06-82
		US-A- 4445187	24-04-84
		US-A- 4569026	04-02-86
US-A-4846693	11-07-89	None	
EP-A-0299831	18-01-89	US-A- 4847699	11-07-89
		AU-B- 610886	30-05-91
		AU-A- 1631388	19-01-89
		JP-A- 1144793	07-06-89

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